Insulin – From Procurement To Patient, The Role Of The Pharmacy Team, A Quality Improvement Project

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BACKGROUND

National Diabetes Inpatient Audit (NaDIA) data from 2019 illustrates that as a Trust, 31.3% of inpatient drug charts contained one or more medication error, 28.1% of inpatient drug charts contained at least one prescription error, and 18.8% of inpatient drug charts contained one or more insulin (prescription or glucose management) error. These figures have risen since 2017, placing the Trust in Quartile 3 or 4 nationally. Given the high risk nature of insulin improving safety of this is paramount and the pharmacy team are well placed to help with this. Prescribing, administration and supply of insulin is multi-faceted.

This project focussed on review of insulin procedures at each stage of an inpatient's journey through the Trust.

INSULIN – FRONT OF HOUSE

BACKGROUND and METHOD

Using an auto generated report from the electronic prescribing system (JAC), all patients prescribed insulin daily were automatically identified. A two week period of 21st November to 6th December 2020 was selected for data analysis. For each patient identified their Accident and Emergency (A&E) admission documentation (CAS card) was reviewed by a pharmacy technician, this was second checked by the diabetes specialist pharmacist. Diabetes diagnosis, time in department, presenting complaint and usual insulin regimen were recorded. From this each case was reviewed to identify if the patients had inappropriately missed any usual insulin doses whilst in A&E.

RESULTS

Sixty people usually on insulin who had been admitted via A&E had their A and E CAS card reviewed to establish if during their time in A&E any insulin had been omitted.

Analysis showed that 13 patients, 22%, missed insulin whilst in A&E.
Of these, 6 patients, had type 1 diabetes.

No CAS Card, 9
Did not miss insulin, 38
Missed insulin, 13
Type 2 54%
Type 1 46%

OBJECTIVES

- Improve and raise awareness of insulin safety across the Trust
- Identify baseline of omitted doses of insulin in A&E
- Identify baseline of issues with insulin administration back of house

- Improve insulin supply processes from pharmacy to wards
- Reduce dispensing errors, optimise storage and reduce waste
- Explore patient experience around insulin administration

INSULIN – BACK OF HOUSE

BACKGROUND and METHOD

Utilising the same patient data and timescale, insulin administration following admission, was reviewed by the pharmacy technician and diabetes specialist pharmacist using JAC and NerveCentre.

For each day the following was recorded:

- No. of inpatients on regular insulin
- No. of insulin doses prescribed
- No. of doses not given inappropriately
  - Clinical status was reviewed by the pharmacist to establish if omission of insulin was appropriate

- No. of doses given late (defined as <90mins or >90mins compared to prescribed time, definition as per JAC system)
- Doses signed as self-administered

RESULTS

Over the sixteen day period **7 (1.5%) of 457** prescribed insulin doses, were omitted inappropriately.
On 3 occasions the patients who missed insulin had Type 1 Diabetes. Placing these patients at risk of Diabetic Ketoacidosis, a medical emergency. Doses given late totalled 65, 14%.
Another common theme identified was insulin administering swapping between nurse administration and self-administration when signed off on the electronic system. The lack of a self-administration of insulin policy across the Trust may exacerbate this.

PATIENT EXPERIENCE

Each patient was contacted by the patient experience team to undertake a questionnaire about their experience, 13 responses were received. Some responses are shown in the graphics below.

Did you administer your insulin during your admission to A&E or did a nurse administer this?

Do you know whether any of your insulin doses were missed during your admission to A&E?

"I'm not sure, I did not take any as wasn't told to but not sure if this was the intention or not, was not explained."

"I was looked after really well but looking back I think if someone had of explained what was happening with my insulin it would have been better for me"

"No, I wasn't sure if I was to take it as it wasn't explained, I wasn't aware any nurse gave me any insulin."

INSULIN – WITHIN PHARMACY

It was highlighted that there were numerous dispensing errors occurring in the pharmacy dispensary relating to insulin, including insulin selection errors when dispensing/supplying insulin.

To establish the baseline of errors frequent cycle counts of the dispensary insulin stock were undertaken to identify if stock levels were as expected as stock is booked out electronically. Discrepancies in cycle counts highlighted selection errors were occurring.

To reduce selection errors the insulin storage fridge was reviewed. Insulin was reorganised by type, rather than by device to group all insulins of the same type together.
This is shown in the photographs. Left: before. Right: after.

CONCLUSIONS AND LIMITATIONS

This data collection shows there are issues with insulin administration across all areas of the Trust.
Patients admitted on insulin face a very real risk of missing or receiving insulin late.
This data was limited as it was recorded purely from electronic systems, to further enhance this work patient medical and nursing notes could be reviewed. Furthermore, as this was a retrospective review no action was put in place when omissions were identified to identify if this improved patient care and reduced late and missed doses. To avoid observational bias a retrospective review was chosen, for comparison it would be interesting to explore if pharmacy interventions could then improve patient care.

FURTHER WORK

To develop this work further the results from the front of house work have been presented at the A&E Morbidity and Mortality meeting. Further work is ongoing to establish how pharmacy can support reduced missed insulin doses in A&E.
To further establish the impact of missed doses, further analysis will be carried out reviewing patients prescribed biphasic and short and rapid acting insulins, the timing of which is critical relative to food/oral intake, to enable maximal therapeutic benefit and blood glucose control. This work has also highlighted the need for a self-administration policy for insulin.